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volume for dendrologists everywhere. It will be dealt with more properly in the journals of botany. I trust that I shall be forgiven the personal note in a comment which the inspection of these two stately volumes leads me to make. Prof. Jepson has completed a task which was the life work of one of the sweetest souls who ever gave up a lifetime to the massive botany of the trees, nowhere more massive than in the Californian mountains, Dr. Albert Kellogg. A quarter of a century ago it was my privilege to share the working table at which Kellogg day after day was elaborating his drawings from field sketches and herbarium specimens. Those were days of high zeal in the California Academy of Sciences, days of disregarded poverty, for not yet had Lick's endowment become available. Kellogg completed his drawings of the oaks and the conifers, he did not live to complete the work which now at last is accomplished. After Kellogg's death Prof. George Davidson endeavored to secure the publication of this great collection of drawings. The purse of the Academy, all at once become fat, was closed against this memorial to the simple soul who had kept alive the flame of study in the long years of poverty, himself a founder of the institution. An obstacle was always grateful to Davidson when he knew himself in the right; he secured a Mæcenas and thus provided for the publication of the oaks, a bantling without academic fathering, under the title of "West American Oaks" for which the text was written by Prof. E. L. Greene. It is most gratifying to observe that Prof. Jepson gives cordial credit to his predecessor. Without slighting in the least the necessities of formal botanical description the author has set before himself the purpose of making his work of value to the layman; this is well accomplished in general. Particular interest will attach to his careful study of the redwood and the sequoia, the big trees of the Sierra and the Coast Range.

WILLIAM CHURCHILL.

Canada. By A. G. Bradley. Home University Library. 256 pp. Index. Henry Holt & Co., New York, 1912. 50 cents. 7 x 4½.

The history of Canada is related in a very interesting and vivid style. For one who is seeking only a general knowledge of the critical periods in the development of the Dominion, this book will answer. The presentation is from the viewpoint of an Englishman and therefore is of special value to the American reader. It is worthy of note that the entire discussion is free from bias.

Chapter I presents the geography of the region in an excellent non-technical descriptive manner. It is rather unfortunate, however, that a map does not accompany the text. Chapter II, "The Conquest of Canada," brings out a number of illustrations of the close relation of historical events to the physical environment. A quotation from the last paragraph of Chapter VIII, "Prairie Provinces," referring to southwestern Canada, will indicate the general tone of the geographic discussions in the book:

"Gold, silver, coal, iron, fruits, wool, tropical products, timber, can all create wealth and population. But these by themselves are not comparable, for the up-building of a hardy race, to a deep rich soil in a bracing climate, where both the essentials of a local subsistence and food products that the outer world must have are grown at the door over thousands of square miles."

While this book is not wholly scientific and no doubt is intended as a history rather than a geography, it is worthy of recognition by the geographer. A descriptive bibliography of 16 titles is appended.

EUGENE VAN CLEEF.

SOUTH AMERICA

Reisen in Bolivien und Peru. Ausgeführt 1908. Von Rudolf Hauthal.

Maps, illustrations, appendices and index. x and 247 pp. Wissenschaftl. Veröffentl. der Gesell. für Erdkunde zu Leipzig. 7. Band. Verlag von Duncker & Humblot, Leipzig, 1911.

Prof. Hauthal's book is mainly concerned with the former glaciation of South America's tropical plateaus. His earlier work showed Patagonia under a glacial ice sheet from the Atlantic to the Pacific south of the 49th parallel. Here we have him looking for evidence of glaciation in the arid highlands. He found it and the book establishes the fact solidly with all desired detail of glaciated ledges, moraines and morainic lakes. Oversteepened valleys and hanging tributary valleys are not in his vocabulary, but he saw them, especially

in the country above Lima. He quotes with approval Steinmann's view that glaciation was contemporary in both hemispheres and the cause, extra-terrestrial. In South America there were plainly two glaciations, the first heavy, its glaciers descending in Peru to 2,800 meters, in East Bolivia (E. side of Cordillera Real?) to 3,000 and in the northern Argentine to 3,500. In the second, the lowest points reached were a thousand meters higher. At present the ice tongues are 800 or 900 meters higher still. One judges that little of Bolivia was ever under ice. This must be charged to the aridity of the region.

The discussion of wind and precipitation that occurs at several points seems to be the weak part of the book, the only weak one in a very strong work. This comes up in connection with the very interesting question of the relative height of the snow line, etc., on the eastern and western ranges. Meyer and Reiss are quoted as finding the snow line lower toward the Amazon in Ecuador. Hauthal, though seeing but the west side of the Cordillera Real in Bolivia, is satisfied from all reports that the opposite is true there, *i. e.*, that the glaciers lie lower on the western slope. He explains it for his season, December to March, by daily clouding toward noon, thus keeping the western sun from shining on the mountains and melting the snow. But he suggests that this might be different in June-July, when a cloudless sky allows equal insolation on each slope. It is argued at page 117 that this would give the snow line equal height on each side, but at 171 the stronger afternoon sun is supposed to melt more on the west and give a higher snow line there. He makes the important point that snow line measures in this region should be made at the same season or they are not comparable. Yet he was astonished above Lima to see the low Sierra de la Sal, 160 kilometers to the east, with more ice on it than on the higher, western ranges. He thinks the east winds from the Amazon basin should be warm and melt the eastern snows or keep the ranges too warm for snow to fall on them.

It seems here that he must fail to take into account the adiabatic cooling that accompanies the uplift of these eastern airs through heights of 10,000 to 20,000 feet. The hot airs of the La Paz valley (p. 172) should be cooled to freezing by the expansional loss of temperature before they reach the plateau even if they were at 90° in the plains and lost some rain with liberation of latent heat on the way. Greater snows are to be expected near the Amazon basin because of the greater moisture in the air there. Prof. Bowman tells me he found the same thing there. It is for this that season matters so much. The present writer recalls his astonishment in three winters that he spent just east of Aconquija in northern Argentine to see the mountain bare in the cold weather but often snow-clad in the rains of summer (December). Nor is the snow fall in Patagonia with east winds strange to anyone familiar with the cyclonic winds.

Apart from this minor detail no one could read Hauthal's pages and doubt the glaciation. It is thoroughly made out.

Even more interesting are his notes of travel, notably in Bolivia on the highland, of which he gives a vivid picture. He has no suspicion of a peneplain. For him it is an upland made from great folds of rocks striking N. W.-S. E. on which numerous volcanoes have poured out their lavas and filled the hollows. A lively example of travel is the extra-post trip from Oruro to La Paz, 200 kilometers in 24 hours over a roadless land. One gets a vivid picture of the handful of Bolivians of European blood ruling the hostile Aymaras who vastly outnumber them, through the Cholo half-breeds of double affinities. His travel notes make singularly good reading and so too his brief touches on the antiquities of the land. At Tiahuanaco the ruins deteriorate perceptibly between visits. The young men of La Paz make revolver practice on the ancient carvings. He has hearty words of praise for citizens of the better classes both of Bolivia and Peru. They are striving for better things.

MARK JEFFERSON.

ASIA

Le Laos. Par Lucien de Reinach. Édition posthume, revue et mise à jour par P. Chemin Dupontès. vii and 392 pp. Map.* E. Guilmoto, Éditeur, Paris. 1911. Fr. 7.50. 9 x 5½.

The author of this work died before his task was done. In the form in which it sees the light it is the erection of a monument to the memory of a

* Listed under "French Indo-China" in *Bull.*, Vol. 43, 1911, p. 877.